Introduction to Data Management CSE 344

Lecture 3: SQL Basics

CSE 344 - Winter 2017

Announcements

• WQ1 due on Tuesday

– Any issues?

- WQ2 will be out tomorrow
 - SQL basics and aggregates
 - Due in 1 week
- HW1 due on Wednesday

Review

- Relational data model
 - Instance and schema
- SQL for manipulating relational data
 - Create tables
 - Retrieve records from tables
 - Declare keys and foreign keys

Review

- Tables are NOT ordered
 - they are sets or multisets (bags)
 - arity: # of attributes in a relation
 - cardinality: # of records in a relation
- Tables are FLAT
 - No nested attributes
- Tables DO NOT prescribe how they are implemented / stored on disk

- This is called **physical data independence**

\frown	From L Adding , country, no		es	
cname country no_employees for_profit				
Canon	Japan	50000	Y	
Hitachi	Japan	30000	Υ	

- Let's add a list of product that each company produces
 - How? Recall that tables are flat!

From Last Time: Adding Attributes

Company(<u>cname</u>, country, no_employees, for_profit)

(cname	country	no_employees	for_profit
	Canon	Japan	50000	Υ
	Hitachi	Japan	30000	Υ

Product(pname, price, category, manufacturer)

pname	price	category /	manufacturer
SingleTouch	149.99	photography	Canon
AC	300	Appliance	Hitachi

Today

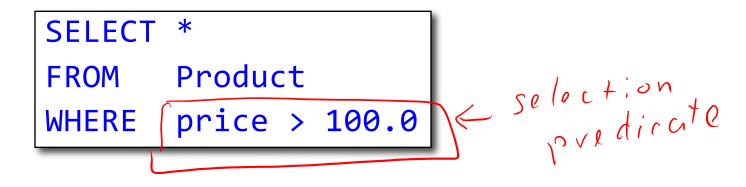
- SQL Basics
 - Selection
 - Projection
 - Ordering and distinct
 - Joins

SQL

- SQL
 - Structured Query Language
 - Most widely used language to query relational data
 - One of the many languages for querying relational data

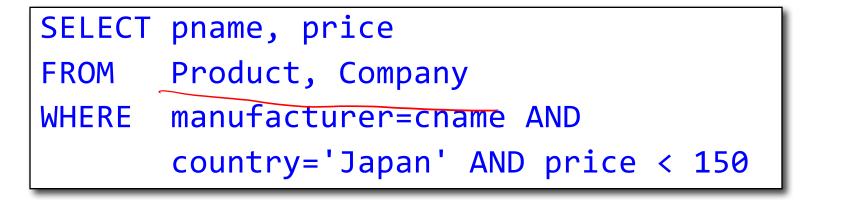
- A declarative programming language

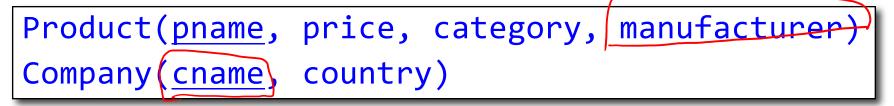
Selections in SQL



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What does this query do?

SELECT	pname, price
FROM	Product, Company
WHERE	<pre>manufacturer=cname AND</pre>
	country='Japan' AND price < 150

Product(pname, price, category, manufacturer)
Company(cname, country)

Retrieve all Japanese products that cost < \$150

Product(pname, price, category, manufacturer)
Company(cname, country)

	pname	price	manufacturer	cname	country	
\rightarrow	MultiTouch	199.99 (Canon	GizmoWorks	USA	\leftarrow
	SingleTouch	49.99	Canon	Canon	Japan	
	SuperGizmo	250.00	GizmoWorks	ounon	oupun	

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Product(pname, price, category, manufacturer)
Company(cname, country)

pname	price	manufacturer	cname	country
MultiTouch	199.99	Canon	GizmoWorks	USA
SingleTouch	49.99	Canon	Canon	Japan
SuperGizmo	250.00	GizmoWorks	Ganon	oupun

Retrieve all American companies that manufacture "gadget" products

Product(pname, price, category, manufacturer)
Company(cname, country)

pname	price	manufacturer	cname	country
MultiTouch	199.99	Canon	GizmoWorks	USA
SingleTouch	49.99	Canon	Canon	Japan
SuperGizmo	250.00	GizmoWorks	Gallon	oupun

SELECT	DISTINCT cname
FROM	Product, Company
WHERE	<pre>country='USA' AND category = 'gadget' AND manufacturer = cname</pre>